CLAIMS:

1. A composition comprising
   - (i) a modified polypeptide comprising
     - (a) a polypeptide derived from the extracellular domain of CD46, and
     - (b) a component capable of binding to a cell surface molecule; and
   - (ii) an adenovirus of the subtype B.

2. The composition of claim 1, wherein said adenovirus is Adenovirus 3.

3. The composition of any of claims 1 to 2, with the proviso that the component (b) of the modified polypeptide is neither a polypeptide derived from CD55 nor an Fc receptor.

4. The composition of any of claims 1 to 3, wherein the polypeptide (a) of the modified peptide does not comprise the wildtype STP-A region of CD46.

5. The composition of any of claims 1 to 4, wherein the polypeptide (a) of the modified polypeptide comprises at least all four SCR-regions of CD46, and preferably also comprises the regions STP-B and STP-C of CD46.

6. The composition of any of claims 1 to 5, wherein the polypeptide (a) of the modified polypeptide is encoded by a nucleic acid comprising
   - (i) a nucleic acid sequence as defined in the SEQ IDs No. 12, 14 or 16,
   - (ii) a nucleic acid sequence which hybridizes to the nucleic acid sequence as defined in (i) under stringent conditions,
   - (iii) a nucleic acid sequence which is degenerate as a result of the genetic code to the nucleic acid sequence as defined in (i) and (ii) and which encodes a polypeptide having essentially the same binding activity as the extracellular domain of CD46, or

(iv) a nucleic acid sequence having a sequence identity of at least 70% with the nucleic acid sequence as defined in (i), or a fragment thereof, and which encodes a polypeptide having essentially the same binding activity as the extracellular domain of CD46.

7. The composition of claim 1, wherein the polypeptide (a) of the modified polypeptide is defined as in the amino acid sequence according to SEQ IDs No. 13, 15 or 17.

8. The composition of any of claims 1 to 7, wherein the component (b) of the modified polypeptide is selected from the group consisting of a small organic molecule, a peptide, and a polypeptide.

9. The composition of any of claims 1 to 8, wherein component (b) of the modified polypeptide is not a polypeptide derived from a polypeptide of the complement pathway.

10. The composition of claim 8, wherein the small organic molecule is selected from the group consisting of a non-proteinaceous hormone, a neuro-transmitter and a synthetic molecule capable of binding to a surface receptor.

11. The composition of claim 8, wherein the component (b) of the modified polypeptide is capable of specific binding to a surface receptor with a dissociation constant of lower than 1μM.

12. The composition of any of claims 1 to 11, wherein the component (b) of the modified polypeptide is capable of binding a molecule selected from the group consisting of a cell type-specific cell surface molecule, a disorder-specific cell surface molecule, a cell-surface receptor, a cell-adhesion molecule and a sugar moiety located on one of the aforementioned molecules, in particular wherein the component (b) is capable of binding a molecule selected from the group consisting of a leukocyte antigen, a receptor tyrosine kinase, a receptor of the TNF receptor family, a cytokine receptor, a G-protein-coupled-receptor, a receptor tyrosine

phosphatase, a chemokine receptor, a scavenger receptor, a Fc-receptor, a tetraspannin, a member of the Ig-superfamily and a lectin.

13. The composition of claim 12, wherein the component (b) of the modified polypeptide is an anti-body or an antibody fragment.

14. The composition of claim 13, wherein the antibody fragment is selected from the group consisting of an scFab, Fab, F(ab')2, diabodies, and an scFv.

15. The composition of claim 8, wherein the polypeptide of (b) of the modified polypeptide is selected from the group consisting of a ligand of cell type-specific cell surface molecule, a ligand of a disorder-specific cell surface molecule, a ligand of a cell-surface receptor, a ligand of a cell-adhesion molecule and a ligand of a sugar moiety located on one of the aforementioned molecules, in particular wherein component (b) is selected from the group consisting of a ligand of a leukocyte antigen, a ligand of a receptor tyrosine kinase, a ligand of a recep-tor of the TNF receptor family, a ligand of a cytokine receptor, a ligand of a G-protein-coupled-receptor, a ligand of a receptor tyrosine phosphatase, a ligand of a chemokine receptor, a ligand of a scavenger receptor, a ligand of a Fc-receptor, a ligand of a tetraspannin, a ligand of a member of the Ig-superfamily and a ligand of a lectin.

16. The composition of any of claims 1 to 15, wherein the polypeptide of (a) and the component (b) of the modified polypeptide are linked to each other by a covalent linkage, preferably chemical crosslinking or genetic fusion.

17. The composition of any of claims 1 to 16, wherein the polypeptide of (a) and the component (b) of the modified polypeptide are crosslinked via a spacer, wherein the spacer is selected from the group consisting of heterobifunctional cross-linkers, flexible amino acid linkers, like the hinge regions of Immunoglobulins, glycine serine linkers and glycine linkers, homobifunctional cross-linkers and stable ligand-receptor pairs, like for example the biotin-streptavidin system.

18. The composition of any of claims 1 to 17, wherein the modified polypeptide is defined as in the amino acid sequence according to SEQ IDs No. 19 or 21.

19. A composition according to any of claims 1 to 18 for use in medicine.

20. A pharmaceutical composition comprising a composition according to one of claims 1 to 18 and a pharmaceutically acceptable carrier.

21. The pharmaceutical composition of claim 20, wherein the adenovirus has been genetically engineered.

22. The pharmaceutical composition of claim 21, wherein the adenovirus has been genetically engineered by introducing a therapeutically active gene construct.

23. The pharmaceutical composition of claim 22, wherein the therapeutically active gene construct comprises a therapeutically active gene operably linked to at least one regulatory sequence for expression of the therapeutically active gene.

24. The pharmaceutical composition of claim 23, wherein the therapeutically active gene is a tumor supressor gene, for example selected from the group consisting of p53, Retinoblastoma, NF2, BRCA1, BRCA2, MSH2, MSH6, MLH1, CDKN2, Apaf1, DPC4, PKD1, HPC1 and VHL.

25. Use of

a composition according to one of claims 1 to 18 wherein the adenovirus of the subtype B has been genetically engi-neered,
or use of a pharmaceutical composition according to one of claims 20 to 24
in the manufacture of a pharmaceutical for the treatment of a disorder or a disease selected from the group consisting of SCID, cystic fibrosis, arthritis, multiple sclerosis and cancer, in particular cancer caused by cells deficient in any one tumor suppressor gene.

26. A modified polypeptide comprising

(a) a polypeptide derived from the extracellular domain of CD46, and

(b) a component capable of binding to a cell surface molecule,

with the provisio that (b) is not a polypeptide derived from CD55.

27. The modified polypeptide of claim 26, with the proviso that the component (b) is neither a polypeptide derived from CD55 nor an Fc receptor.

28. The modified polypeptide of claim 26, wherein the polypeptide (a) does not comprise the wildtype STP-A region of CD46.

29. The modified polypeptide of claims 26 to 28, wherein the polypeptide (a) comprises at least all four SCR-regions of CD46, and preferably also com-prises the regions STP-B and STP-C of CD46.

30. The modified polypeptide of claims 26 to 29, wherein the polypeptide (a) is encoded by a nucleic acid comprising

(i) a nucleic acid sequence as defined in the SEQ IDs No. 12, 14 or 16,

(ii) a nucleic acid sequence which hybridizes to the nucleic acid sequence as defined in (i) under stringent conditions,

(iii) a nucleic acid sequence which is degenerate as a result of the genetic code to the nucleic acid sequence as defined in (i) and (ii) and which encodes a polypeptide having essentially the same binding activity as the extracellular domain of CD46, or

(iv) a nucleic acid sequence having a sequence identity of at least 70% with the nucleic acid sequence as defined in (i), or a fragment thereof, and which encodes a polypeptide having essentially the same binding activity as the extracellular domain of CD46.

31. The modified polypeptide of claim 26, wherein the polypeptide (a) is defined as in the amino acid sequence according to SEQ IDs No. 13, 15 or 17.

32. The modified polypeptide of claims 26 to 31, wherein the component (b) is selected from the group consisting of a small organic molecule, a peptide, and a polypeptide.

33. The modified polypeptide of claims 26 to 32, wherein component (b) is not a polypeptide derived from a polypeptide of the complement pathway.

34. The modified polypeptide of claim 32, wherein the small organic molecule is selected from the group consisting of a non-proteinaceous hormone, a neuro-transmitter and a synthetic molecule capable of binding to a surface receptor.

35. The modified polypeptide of claim 32, wherein the component (b) is capable of specific binding to a surface receptor with a dissociation constant of lower than 1μM.

36. The modified polypeptide of any of claims 26 to 35, wherein the component (b) is capable of binding a molecule selected from the group consisting of a cell type-specific cell surface molecule, a disorder-specific cell surface molecule, a cell-surface receptor, a cell-adhesion molecule and a sugar moiety located on one of the aforementioned molecules, in particular wherein the component (b) is capable of binding a molecule selected from the group consisting of a leukocyte antigen, a receptor tyrosine kinase, a receptor of the TNF receptor family, a cytokine receptor, a G-protein-coupled-receptor, a receptor tyrosine phosphatase, a chemokine receptor, a scavenger receptor, a Fc-receptor, a tetraspannin, a member of the Ig-superfamily and a lectin.

37. The modified polypeptide of claim 36, wherein the component (b) is an anti-body or an antibody fragment.

38. The modified polypeptide of claim 37, wherein the antibody fragment is selected from the group consisting of an scFab, Fab, F(ab')2, diabodies, and an scFv.

39. The modified polypeptide of claim 32, wherein the polypeptide of (b) is selected from the group consisting of a ligand of cell type-specific cell surface molecule, a ligand of a disorder-specific cell surface molecule, a ligand of a cell-surface receptor, a ligand of a cell-adhesion molecule and a ligand of a sugar moiety

located on one of the aforementioned molecules, in particular wherein component (b) is selected from the group consisting of a ligand of a leukocyte antigen, a ligand of a receptor tyrosine kinase, a ligand of a recep-tor of the TNF receptor family, a ligand of a cytokine receptor, a ligand of a G-protein-coupled-receptor, a ligand of a receptor tyrosine phosphatase, a ligand of a chemokine receptor, a ligand of a scavenger receptor, a ligand of a Fc-receptor, a ligand of a tetraspannin, a ligand of a member of the Ig-superfamily and a ligand of a lectin.

40. The modified polypeptide of any one of claims 26 to 39, wherein the polypeptide of (a) and the component (b) are linked to each other by a covalent link-age, preferably chemical crosslinking or genetic fusion.

41. The modified polypeptide of any one of claims 26 to 40, wherein the polypeptide of (a) and the component (b) are crosslinked via a spacer, wherein the spacer is selected from the group consisting of heterobifunctional cross-linkers, flexible amino acid linkers, like the hinge regions of Immunoglobulins, glycine serine linkers and glycine linkers, homobifunctional cross-linkers and stable ligand-receptor pairs, like for example the biotin-streptavidin system.

42. The modified polypeptide of one of claims 26 to 40, wherein the modified polypeptide is defined as in the amino acid sequence according to SEQ IDs No. 19 or 21.

43. A nucleic acid comprising a nucleic acid sequence encoding a modified poly-peptide according to one of claims 26 to 42.

44. The nucleic acid of claim 43, wherein the nucleic acid comprises

(i) a nucleic acid sequence as defined in the SEQ IDs No. 12, 14 or 16,

(ii) a nucleic acid sequence which hybridizes to the nucleic acid sequence as defined in (i) under stringent conditions,

(iii) a nucleic acid sequence which is degenerate as a result of the genetic code to the nucleic acid sequence as defined in (i) and (ii) and which encodes a polypeptide having essentially the same binding activity as the extracellular domain of CD46, or

(iv) a nucleic acid sequence having a sequence identity of at least 70% with the nucleic acid sequence as defined in (i), or a fragment thereof, and which encodes a polypeptide having essentially the same binding activity as the extracellular domain of CD46.

45. A recombinant expression vector comprising the nucleic acid according to claim 43 or 44 operably linked to at least one regulatory sequence for expression of the modified protein.

46. A host cell containing a nucleic acid according to claims 43 to 44 or a vector according to claim 45.

47. The host cell of claim 46, wherein the host cell is a cell selected from the group consisting of a monocellular phagocyte lineage cell, 293 cells, BHK cells and Sf9 cells.

48. A method of producing a modified polypeptide according to one of claims 26 to 42, comprising culturing a host cell according to claim 46 or 47 under conditions suitable for expression of the modified polypeptide in the host cell and isolating the modified polypeptide from the host cell.

49. The method of claim 48, wherein the isolated modified polypeptide is further formulated as a pharmaceutical composition.

50. A method for preventing or treating a patient in need of such treatment, wherein the patient is administered a therapeutically effective amount of a modified polypeptide according to one of claims 26 to 42.

51. A modified polypeptide according to one of claims 26 to 42 for use in medicine.